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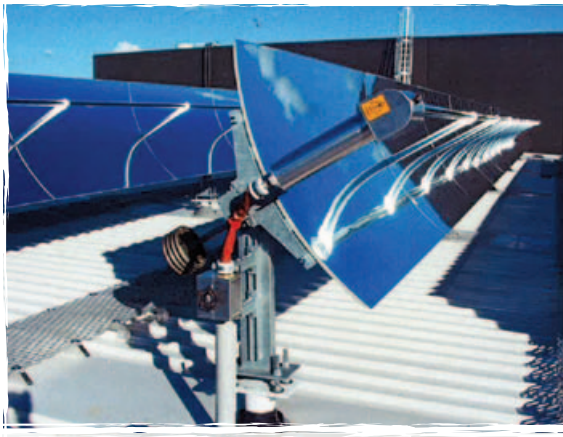
Office of Environment & Heritage



NSW Climate Change Fund
Annual Report 2010–2011

Cover photographs:

1. Tamburlaine Winery
2. Charlestown Shopping Centre, managed by The GPT Group. Courtesy The GPT Group
3. Family saves power with the Save Power Library Kit
4. Rainwater Tanks at Woolworths Regional Distribution Centre, Wyong. Courtesy Woolworths

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Contents

Minister's foreword

Welcome to the 2010–11 annual report for the New South Wales Government's Climate Change Fund.

This report demonstrates the resource efficiencies and cost savings that are being achieved across our state with financial support from the Fund.

The Fund has expended $63 million during the financial year to help households, businesses, communities and government. To date an estimated 19.8 billion litres of water, 924,000 megawatt hours of electricity, 992,000 tonnes of greenhouse gas emissions and $200 million on water and energy bills a year, as well as 67,000 kilowatts of peak demand has been saved. On average, every $1 the Fund invests in energy and water saving initiatives delivers more than $5 in utility bill savings.

The Fund also provided $82 million to other programs, including the Coal Innovation NSW Fund, national energy market projects and communication projects, as well as fund administration. It has also provided $138 million to the Solar Bonus Scheme to support households and small businesses to adopt renewable energy technologies.

NSW households are enthusiastically using free assessment tools and tailored plans to reduce power bills and help our environment.

The Fund is helping lower income households reduce their power use by up to 20 per cent through free expert advice, a Power Savings Kit and a Personal Action Plan.

One in eight NSW households have taken advantage of NSW Home Saver Rebates to make their home more water and energy efficient, and save on bills.

Low-cost and effective water and energy saving technologies are helping not-for-profit organisations across NSW protect their local environment and reinvest money saved on bills into delivering valuable community services.

Increased expertise and training in energy efficiency are transforming the market and strengthening skills across a range of NSW industries.

Local and state government agencies are also taking practical actions to increase environmental performance, reduce costs and minimise their impacts on the environment.

The Fund is helping households, business and industry generate clean energy and reduce grid demand by supporting proven and emerging technologies. This also drives demand for new jobs, and places NSW in a strong position to attract investment.

The Government is committed to working in partnership with business, communities and households to deliver long-term environmental outcomes that are economically sustainable.

Robyn Parker MP | Minister for the Environment

NSW Climate Change Fund overview

The NSW Climate Change Fund

The NSW Climate Change Fund was established under the *Energy and Utilities Administration Act 1987* (the Act) and is administered by the Office of Environment and Heritage (OEH) within the NSW Department of Premier and Cabinet. The specific functions of the Fund, as outlined in section 34F of the Act, are to provide funding:

- to reduce greenhouse gas emissions and the impacts of climate change associated with water and energy activities
- to encourage water and energy savings and water recycling
- to reduce the demand for water and energy, including addressing peak demand for energy
- to stimulate investment in innovative water and energy savings measures
- to increase public awareness and acceptance of the importance of climate change and water and energy savings measures
- for contributions made by the State for the purposes of national energy regulation.

The Fund delivers funding to achieve outcomes by:

- providing direct financial support to households, businesses, government, schools and community organisations to help implement measures that will save water and power (and related greenhouse gas emissions), and so reduce water and energy utility bills
- stimulating investment in clean energy technologies in NSW, through funding for the commercialisation of emerging technologies, and additional support for proven technologies such as wind and solar power.

How is it funded?

The Fund's main source of revenue for the 2010–11 financial year was annual contributions from electricity providers – including Ausgrid, Endeavour Energy and Essential Energy – and water suppliers Sydney Water, Gosford City Council and Wyong Shire Council.

Under the Act, the Minister for the Environment requires water utilities and network service providers to make contributions to the Fund via the annual gazettal of Contributions Orders. Where required, the Minister seeks concurrence of relevant Ministers in the preparation of the Contributions Orders.

Additional monies to the Fund come from interest earned on cash balances, and funds advanced by the Treasurer for managing the Solar Bonus Scheme.

The 2010–11 Annual Report

This annual report has been prepared according to the requirements of the Act (section 34H). Activities under the Fund are reported for the fourth financial year of operations from 1 July 2010 to 30 June 2011.

As required by the Act, this report provides information on fund allocations and anticipated benefits, with reference to the key performance indicators and purposes of the Fund. The performance of the Fund is reported by grouping initiatives as power savings, water savings and clean energy.

Key performance indicators for the Fund are:

- savings in water, energy (consumption and peak demand) and greenhouse gas emissions
- savings in annual energy and water bills for households, business, government, community groups and other organisations
- clean energy generated
- cost-effectiveness (per funding dollar spent)
- funding allocated.

Highlights for 2010–2011

To 30 June 2011, the Fund allocated or paid $363.9 million to help households, businesses, communities and government save an estimated 19.8 billion litres of water, 924,000 megawatt hours of electricity, 992,000 tonnes of greenhouse gas emissions and $200 million in water and power bills a year, as well as 67,000 kilowatts of peak demand.

On average, every $1 the Fund invests in energy and water saving initiatives across all programs delivers more than $5 in utility bill savings (see Table 1).

These savings are being delivered through 1,048 funded projects; assistance for households, including 339,500 rebates, 41,000 assessments in lower income households and 31,000 public housing retrofits; and assistance to 14,850 businesses.

Of these 1,048 funded projects, 658 have already been completed.

Households

The Fund provided $195.4 million to help households save an estimated 5.2 billion litres of water, 531,000 megawatt hours of electricity, 564,000 tonnes of greenhouse gas emissions and $95 million in water and power bills a year, as well as a reduction of 10,000 kilowatts of peak demand. This is being delivered through 22 projects, 339,500 residential rebates and fridge removals, 31,000 public housing retrofits, and assistance to 41,000 lower income households.

On average, every $1 the Fund invests in energy and water saving initiatives in households delivers more than $4 in utility bill savings (see Table 1).

One in eight NSW households have taken advantage of NSW Home Saver Rebates to make their home more water and energy efficient.

Thirty-one local councils have received up to $5,000 for promotional activities to increase rebate uptake in their Local Government Area.

The $63 million Home Power Savings Program is offering 220,000 lower income households across NSW a free home energy assessment, energy refit and tailored advice. Thirty-six local councils are promoting the Home Power Savings Program to local residents as well as general Save Power information with the support of $6,000 grants.

The Solar Bonus Scheme is supporting more than 124,000 households and small businesses to establish small-scale renewable energy systems that are connected to the electricity grid.

The average cost to the Fund to obtain greenhouse gas emission reductions for household programs is $25.31 per tonne (see Table 2).

Businesses

The Fund provided $90.3 million to help businesses save an estimated 11.5 billion litres of water, 326,000 megawatt hours of electricity, 358,000 tonnes of greenhouse gas emissions, and $86.2 million in water and power bills a year, as well as 38,000 kilowatts of peak demand. These savings are being delivered through 112 projects and two key sustainability programs for businesses.

On average, every $1 the Fund invests in energy and water saving initiatives in businesses delivers more than $9 in utility bill savings (see Table 1).

More than 13,000 businesses have received energy assessments and a tailored action plan as part of the Energy Efficiency for Small Business Program, estimated to save an average of $609 in energy costs and 2.6 tonnes of greenhouse gas emissions a year for each business.

A total of 550 medium to large businesses have joined the Sustainability Advantage Program to access subsidised energy audits and technical support to help them save energy and reduce greenhouse gas emissions. To 30 June 2011, the program has helped businesses identify measures to save 148,000 tonnes of greenhouse gas emissions and $25.5 million on power bills a year.

High-end users have completed 220 Water Savings Action Plans and 206 Energy Savings Action Plans. Combined, these plans have identified cost-effective actions saving 6.5 billion litres of water, 418,000 megawatt hours of electricity and more than 729,000 tonnes of greenhouse gas emissions a year. This is estimated to save $17.7 million off water bills and $109 million off power (electricity and gas) bills each year through the implementation of those actions. By 30 June 2011, 53 per cent of cost-effective water measures and 48 per cent of cost-effective energy measures had been implemented.

Around 1,300 vocational students, mainly from the utilities and construction sectors, received energy efficiency training.

Six large-scale projects for commercialising emerging technologies are being funded to generate an estimated 96,000 megawatt hours of electricity and save around 102,000 tonnes of greenhouse gas emissions a year.

Six Wind Renewable Energy Precincts have also been established in NSW.

In June 2011, the NSW and Australian Governments announced Moree Solar Farm Pty Ltd – a consortium led by BP Solar, Fotowatio Renewable Ventures and Pacific Hydro – as the winner of round one of the Australian Government's Solar Flagships Program.

The average cost to the Fund to obtain greenhouse gas emission reductions for business programs is $13.07 per tonne (see Table 2).

Communities

The Fund provided $28 million to not-for-profit community organisations to help make their facilities more water and energy efficient, reduce utility bills and to inspire the wider community to do the same.

Five hundred and eleven projects are expected to save an estimated 1.4 billion litres of water, 30,400 megawatt hours of electricity, 32,500 tonnes of greenhouse gas emissions a year and 2,600 kilowatts of peak demand. This translates to estimated savings of $8 million in water and power bills a year.

On average, every $1 the Fund invests in energy and water saving initiatives in community facilities delivers more than $2 in utility bill savings (see Table 1).

Under the second round of the Community Savers stream of the Public Facilities Program, around 800 not-for-profit community organisations applied for up to $40,000 funding to make their facilities more water and/or energy efficient.

The average cost to the Fund to obtain greenhouse gas emission reductions for community programs is $41.66 per tonne (see Table 2).

Eighteen per cent of 122,782 calls made to the Environment Line in 2010–11 were related to the NSW Climate Change Fund.

Government

The Fund provided $50.2 million to 403 projects to help local government, state government and schools save 1.7 billion litres of water, 37,000 megawatt hours of electricity and 37,700 tonnes of greenhouse gas emissions a year and 16,000 kilowatts of peak demand. This translates to estimated savings of $10.2 million in water and power bills a year.

On average, every $1 the Fund invests in energy and water saving initiatives in state and local government facilities delivers more than $2 in utility bill savings (see Table 1).

Councils and government agencies have completed 78 Water Savings Action Plans and 61 Energy Savings Action Plans. Combined, these plans identified cost-effective actions saving 1.8 billion litres of water, 40,000 megawatt hours of electricity and more than 96,500 tonnes of greenhouse gas emissions a year. This is estimated to save $4.9 million off water bills and $7.6 million off power (electricity and gas) bills a year through the implementation of those actions. By 30 June 2011, 28 per cent of identified cost-effective water measures and 49 per cent of identified cost-effective energy measures had been implemented.

A total of 85 NSW high schools received lighting retrofits, which are estimated to save more than 4,000 megawatt hours of electricity, 4,300 tonnes of greenhouse gas emissions, and $860,000 off power bills a year.

Two hundred and eighteen schools received funding to install rainwater tanks, and 182 schools received funding for water audits, water saving devices and water use monitoring. Together, these schools are estimated to save 350 million litres of water and $950,000 in water bills a year.

The first round of the $13 million Recycling and Stormwater Harvesting Program was run in late 2010, providing funding to six councils and four businesses to support potential suppliers, distributors and customers of recycled water.

The Fund allocated $6.4 million to the Government Building Retrofit Program pilot, which will upgrade water and energy efficiency in government owned and tenanted buildings across 60 sites in the Illawarra and Lower Hunter regions, and the Circular Quay Precinct.

Table 1

NSW Climate Change Fund estimated return on investment by sector (to 30 June 2011)

Sector	Funding approved ($)	Estimated return on investment for each dollar spent ($)
Business	90,283,663	9.54
Households	195,372,560	4.59
Government	50,231,599	2.02
Community facilities	28,004,554	2.92
Total	**363,892,376**	**5.34**

Return on investment = estimated bill savings over 10 years (five years for the Home Power Savings Program) divided by funding approved for energy and water saving initiatives from Tables 2, 3 and 4 (includes natural gas bill savings).

Table 2

Funding and expected outcomes for power savings by sector and resource savings (to 30 June 2011)

Power savings	Funding approved ($)	Estimated MWh savings per year	Estimated tCO_2-e savings per year	Estimated annual savings ($) (electricity bills)	Cost-effectiveness* $/MWh	Cost-effectiveness* $/$tCO_2$-e
Business	33,879,509	230,124	255,532	39,659,388	14.78	13.07
Households	142,148,708	531,078	564,303	84,230,430	27.98	26.33
Government	27,446,553	37,083	37,674	6,157,349	74.43	73.29
Community facilities	6,686,182	16,028	17,237	2,583,412	44.02	41.66
Total	**210,160,952**	**814,313**	**874,746**	**132,630,579**	**26.63**	**24.78**

Table 3

Funding and expected outcomes for water savings by sector and resource savings (to 30 June 2011)

Water savings	Funding approved ($)	Estimated ML savings per year	Estimated annual savings ($) (water bills)	Cost-effectiveness* $/ML
Business	31,578,270	11,551	31,264,302	0.27
Households	53,223,852	5,210	10,442,941	1.05
Government	22,785,046	1,665	4,322,180	1.39
Community facilities	15,286,964	1,374	3,461,537	1.17
Total	**122,874,132**	**19,800**	**49,490,960**	**0.63**

Table 4

Funding and expected outcomes for clean energy by sector and resource savings (to 30 June 2011)

Clean energy	Funding approved ($)	Estimated MWh generated per year	Estimated tCO_2-e savings per year	Estimated annual savings ($) (electricity bills)	Cost-effectiveness* $/MWh	Cost-effectiveness* $/$tCO_2$-e
Emerging technologies	24,825,884	96,012	102,473	12,673,584	25.86	24.23
Proven technologies	6,031,408	14,434	15,300	2,069,864	41.78	39.42
Total	**30,857,292**	**110,446**	**117,773**	**14,743,448**	**27.94**	**26.20**

See Appendix B for tariffs and data sources.

Does not include Water and Energy Savings Action Plans.

Power savings table includes savings (MWh, tCO_2e, KW and $ electricity bill savings) from designated water savings projects.

Water savings table includes savings (ML and $ water bill savings) from designated power savings projects.

*Cost-effectiveness of funding = funding divided by 10 years of savings for all programs except the Home Power Savings Program, which is five years. tCO_2-e/MWh conversion factor from National Greenhouse Accounts (NGA) July 2011 = 1.06.

Cost-effectiveness is calculated using funding and savings for designated energy or water projects; i.e. cost-effectiveness does not take into account the water savings from power projects and the electricity savings from water projects.

Power savings

The Fund provided $210 million to help households, businesses, community organisations and government save an estimated 810,000 megawatt hours of electricity, 870,000 tonnes of greenhouse gas emissions and $135 million in power bills a year, as well as 48,000 kilowatts of peak demand.

These savings are being delivered through 428 projects, 198,471 residential rebates, 12,168 public housing retrofits, 40,948 lower income household assessments and retrofits, and by assisting 14,850 businesses.

Power savings for households

To date $142 million support from the NSW Climate Change Fund, more than 251,000 NSW households are saving an estimated 531,000 megawatt hours of electricity, 564,000 tonnes of greenhouse gas emissions and $85 million off their power bills a year, as well as 10,700 kilowatts of peak demand.

Achievements

NSW households have taken advantage of 148,413 NSW Home Saver Rebates and switched from an electric system to a solar, heat pump or gas hot water system to make their homes more energy efficient. An additional 26,088 households installed ceiling insulation to improve comfort levels and the efficiency of heating and cooling their homes with the support of a Home Saver Rebate.

The Home Saver Rebate program finished, as scheduled, on 30 June 2011. Power savings for the NSW Home Saver Rebates are shown in Table 5 below.

A total of 23,970 NSW households in Metropolitan Sydney, Central Coast, Blue Mountains, Illawarra and Shoalhaven areas recycled their inefficient second fridge through the Fridge Buyback Program. On 4 June 2011, the Minister announced the Fridge Buyback Program would be extended until 30 June 2012. The program was also expanded in September 2011 to include parts of the Hunter region.

The $63 million Home Power Savings Program offers 220,000 lower income households across NSW a free home energy assessment, energy refit and tailored advice to save up to 20 per cent off their power use and help the environment. Items in the Power Savings Kit include a stand-by power switch, energy efficient light bulbs, a water saving showerhead, low-flow tap aerators, and draught excluders. By the time it is completed in June 2014, the program is expected to have reduced annual household bills by $58 million and carbon pollution by 233,000 tonnes a year.

A total of 5,523 public housing residents had electric storage hot water systems replaced with climate-friendly systems, and 7,285 homes have been insulated. Together, these initiatives are saving residents an estimated 16,462 megawatt hours of electricity, 17,450 tonnes of greenhouse gas emissions and $2.2 million their power bills a year.

The $15 million Save Power program is increasing people's understanding of their power use and how to save power. The program uses best practice social marketing integrated with education and social research activities. It includes:

- mass-media communication (including the Save Power advertising campaign, information resources, campaign website – savepower.nsw.gov.au – and below the line advertising)
- community education (including the Save Power Retail Program, the Save Power at Home Library program and the CSIRO partnered Energymark NSW program)
- social research and evaluation (including campaign tracking and program evaluation).

The Save Power program informs and motivates changes in energy use and informs the community of other energy efficiency initiatives, to help people make their homes more water and

Table 5

Energy efficient NSW Home Saver Rebates (to 30 June 2011)

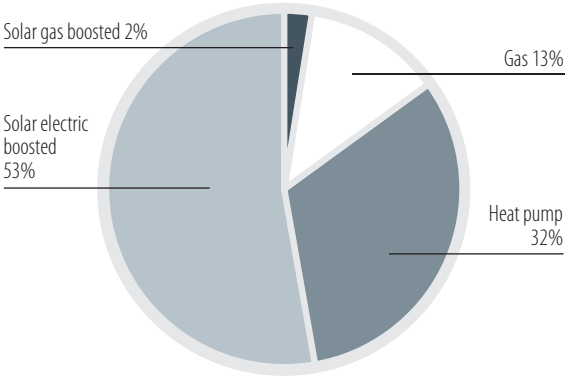
Rebate	Number of rebates	Estimated savings MWh/yr)	Estimated savings (tCO_2e/yr)	Estimated bill savings ($/yr)
Climate-friendly hot water system	148,413	350,031	371,033	36,361,185
Fridge Buyback rebate	23,970	15,829	16,779	6,352,050
Ceiling insulation (ended on 30 June 2009)	26,088	12,306	13,044	3,130,560
Total	**198,471**	**378,166**	**400,856**	**45,843,795**

energy efficient. It also provides the communications framework for all other elements of the Energy Efficiency Strategy.

An additional 11 energy saving projects for households are being implemented with $6.5 million in funding. Projects include residential audits, refits with energy efficient appliances, and education and awareness campaigns. These projects will help save 92,900 megawatt hours of electricity, more than 99,800 tonnes of greenhouse gas emissions and $25 million in power bills a year. Ten of these projects have been completed.

Figure 1

Hot water system rebates paid by system type



One in eight households get a rebate

On 30 June 2011, the Home Saver Rebates program ended as scheduled. Since the program began in July 2007, NSW households have received 339,575 rebates to help invest in water and energy efficient appliances or systems in their homes, and 23,970 inefficient second fridges have been removed. This represents one in eight households across the state taking advantage of the NSW Home Saver Rebates.

Rebates have been available for rainwater tanks, solar, gas or heat pump hot water systems, insulation, water efficient washing machines, dual flush toilets and hot water circulators.

One in three rainwater tanks are connected to a toilet and/or washing machine, compared to one in six in July 2007, when the rainwater tank program began.

The rebate program helped transform the washing machine market so it now offers consumers a higher proportion of machines with a minimum 4-star Water Efficiency Labelling and Standards (WELS) rating.

When the NSW Home Saver Rebates Program began in August 2008, four per cent of all available washing machines in NSW had 4.5 or more stars, compared with 60 per cent of available washing machines when the rebate ended in July 2010.

■ CASE STUDY

Free advice and Power Saving Kits

Heather and Brian from Richmond are set to save at least $129 a year from their free Power Savings Kit and around $340 more by following the advice of the energy expert who visited their home as part of the NSW Government's Home Power Savings Program.

Like many pensioners and families on a lower income, Brian and Heather were feeling the pressure of the increasing cost of living, so they decided to join the program to see if there was more they could do around their home to lower their utility bills.

Brian and Heather said the energy expert's advice and the power saving items they received for free are really making a difference.

"We realised that we probably weren't doing enough to save energy," Brian said.

"Times are tough – particularly for pensioners – so it was great that these items and the service are offered free of charge.

"We got a powerboard, a shower timer, weather proofing for the door and a lot more. Not only were these things free but we noticed the difference they made.

"This program has been fantastic and given us many tips to help save power and save money," he said.

Energy expert Rob Hili says that like the Donkins, most families are very grateful for the advice they receive – be it finding out the running costs of their appliances or learning how to understand their electricity bill.

"I believe that information is empowering. When people know where and how they are using electricity in the home, they can make informed decisions as to what they want to do to reduce how much they use," Rob said.

"That's the beauty of this program – by visiting each household we can provide tailored information to suit their needs," he said.

Brian and Heather have recommended the program to their family, friends and neighbours.

"Have we had to sacrifice any of our comforts to reduce power bills? Not at all! It's been really worthwhile," Brian said.

■ **CASE STUDY**

Households get energy smart

NSW households are taking advantage of Save Power Kits and the Save Power Retailer Program to help make their homes energy efficient and lower their power bills.

Funded by the NSW Climate Change Fund, these programs help households tailor energy saving solutions for their circumstances and needs.

Save Power Kits can be borrowed for free from many local libraries across NSW. The kits help households identify which appliances in their home use the most power, and provide easy steps to save power, money and the environment.

The Save Power Kit includes:

- a Power-Mate Lite energy meter to measure how much power appliances use, how much they cost to run and the carbon pollution they create
- thermometers to help find draughts and to make sure fridges, freezers and heating and cooling appliances are on the right settings
- a stopwatch for timing showers and the amount of hot water used
- a compass to identify which rooms and windows face north and west to maximise access to the sun in winter and cool these rooms with shading in summer.

The kit also includes a guide book, worksheet and action plan to identify items that use the most power and suggest simple ways to lower power bills.

The Save Power Retailer Program provides energy efficiency training to sales staff in white goods and appliance stores across NSW, so they can advise their customers on the long-term running costs of the different appliances available.

In the long term, the more efficient products will cost less to run. For example, every extra star on a fridge or freezer will save 23 per cent of the running costs over the life of the appliance.

Staff and stores also have information and energy calculators to help customers make an informed decision when buying televisions, fridges, freezers, dishwashers, washing machines and dryers. Participating retailer stores include Harvey Norman, the Good Guys, David Jones and Myer.

Visit www.savepower.nsw.gov.au for more information.

Power savings for businesses

The NSW Climate Change Fund allocated $34 million to help more than 13,550 NSW businesses save an estimated 230,000 megawatt hours of electricity, 256,000 tonnes of greenhouse gas emissions, and $42 million off their power bills a year as well as 26,940 kilowatts of peak demand, through 43 projects and two key assistance programs.

Achievements

Under the Green Business Program, the Public Facilities Program and the former Energy Savings Fund, the Fund provided $16 million to implement 43 energy saving projects for businesses. These projects will help save 90,700 megawatt hours of electricity, 72,400 tonnes of greenhouse gas emissions and $8.5 million in power bills a year. To 30 June 2011, 35 of the 43 projects have been completed.

These projects include generation (including cogeneration), energy efficiency, education and power factor correction initiatives. Technologies being employed include absorption chilling and high efficiency compressors in industrial processes; multi-level lighting systems; and installation of utilities management systems and efficient speed drives. Power savings by project type are shown in Table 6.

In addition, 550 medium to large businesses have participated in Sustainability Advantage program activities including Energy Saver audits, energy saving projects and sector transformation projects. To 30 June 2011, the program has helped businesses identify measures to save 106,000 megawatt hours of electricity, 539,000 gigajoules of gas, 148,000 tonnes of greenhouse gas emissions and $25 million on power bills a year.

More than 14,300 businesses that spend up to around $20,000 a year on power bills or employ up to 10 full-time staff have joined the $15 million Energy Efficiency for Small Business Program. To 30 June 2011, more than 13,000 businesses have received energy assessments and a tailored action plan. It is estimated that these businesses will save an average of $600 in energy costs and 2.6 tonnes of greenhouse gas emissions a year. Rebates of up to $5,000 are available for improvements to lighting, heating, ventilation and cooling, commercial refrigeration, hot water systems, insulation, boilers and compressed air use.

Energy Savings Action Plans have been prepared by 206 business sites that use more than 10 gigawatt hours of electricity a year. Of the cost-effective annual savings of 729,000 tonnes of greenhouse gas emissions (identified in these plans), 48 per cent have already been implemented, with estimated savings of $52 million on electricity and gas bills a year. Commonly implemented measures include installing, upgrading or optimising industry equipment; modifying industrial processes; and improving heating, ventilation and air conditioning (HVAC) by adding sensor controls or replacing systems.

NSW tradespeople and professionals boosted their energy efficiency knowledge and skills under the $20 million Energy Efficiency Training Program, managed by the Office of Environment and Heritage and the NSW Department of Education and Communities. The program targets key trades and

Table 6

Business energy saving projects estimated savings and cost-effectiveness by project type (to 30 June 2011)

Project type	No. of projects	Funding allocated ($)	Estimated savings (MWh/yr)	Estimated savings (tCO_2e/yr)	Estimated peak savings (KW)	Estimated bill savings ($/yr)	Cost-effectiveness ($/(MWh x 10 yrs))
Efficiency measures	31	8,322,112	39,648	40,812	6,400	5,615,070	20.99
Education	2	580,000	15,673	16,613	2,442	2,068,783	3.70
Alternate power generation	5	6,780,000	35,346	14,993	8,536	816,659	19.18
Power factor correction	5	602,804	–	–	9,216	–	–
Total	**43**	**16,284,916**	**90,667**	**72,418**	**26,594**	**8,500,512**	**17.96**

Table note: does not include water saving projects with associated power savings.

professions, such as electricians, plumbers, building managers, engineers, planners and service professionals, to help them improve the design, installation and maintenance of energy efficient products and services.

In the first two years of the program, 1,329 vocational students completed energy efficiency training. A total of 31 industry partnerships have been developed to deliver innovative training in industries such as property and construction, manufacturing, business, sales and IT.

Two universities (University of Wollongong and University of New South Wales) are developing energy efficiency courses for engineering students and practising engineers, and four universities (University of Western Sydney, University of Technology, Sydney, University of New South Wales and Macquarie University) and their industry partners are developing energy efficiency courses for accounting students and practising accountants.

■ **CASE STUDY**

Refrigeration costs slashed

Despite having a heavy reliance on refrigeration, NSW businesses Tamburlaine Wines and Swire Cold Storage have slashed their energy use and costs by participating in the Industrial Refrigeration Program.

The Industrial Refrigeration Program, part of the NSW Climate Change Fund's Energy Saver Program, provides medium to large NSW businesses with subsidised independent energy audits.

Tamburlaine Wine's Managing Director Mark Davidson said an energy audit conducted through the Sustainability Advantage Program showed refrigeration accounted for 75 per cent of the winery's energy use.

Energy saving actions implemented as a result of the audit are saving $110,000 a year and will pay for themselves in less than two years.

"I thought I must have misheard my environment manager when he told me how much money we could save," Mark said.

"The energy audit identified the problem and helped us break some old wasteful energy habits.

"By doing some really simple things – such as running time and thermostat controls, upgrading heat exchangers and making pipework modifications – we have reduced our overall electricity use by 48 per cent and our refrigeration energy use by 54 per cent."

In a similar success story, Swire Cold Storage conducted an energy audit that identified potential energy savings of 786 megawatt hours and $57,000 off electricity bills each year.

Sam Czyczelis, General Manager – Engineering Services at Swire, said the global company had already implemented the recommendations from one of the business cases.

"I was surprised at the amount of energy savings found as a result of the audit. It was better than I thought. I would absolutely recommend the Industrial Refrigeration Program and Energy Saver audits to other businesses," Sam said.

■ CASE STUDY

A cool thirty per cent saved

Vinidex is one of Australia's leading thermoplastic pipe system manufacturers.

The company is now saving energy and producing plastic pipes more efficiently after installing a new energy efficient chiller at its Smithfield site.

Vinidex's pipes are used in many industrial sectors, such as plumbing, electricity, water, sewerage, drainage, mining and telecommunications. Pipe production runs 24 hours a day, seven days a week.

After completing an Energy Savings Action Plan, Vinidex identified the chiller water system as an opportunity for significant energy savings.

Vinidex received $75,000 under the NSW Climate Change Fund to contribute towards the $410,000 total project cost of installing the latest chiller technology. In the first seven months of production, Vinidex reduced the chiller's monthly energy consumption by 30 per cent. The project is estimated to save 300 megawatt hours of energy each year.

Chilled water is essential to the pipe making process. After the pipes have formed the desired shape, the plastic solidifies in chilled water. Chilled water is also used on each production line to cool process water in spray tanks.

The benefits of the new chiller extend beyond significant energy savings. The chiller uses an ammonia refrigerant that is highly efficient and environmentally friendly. Its higher cooling capacity will allow Vinidex to expand the production capacity in the future and the variable speed drive increases efficiency by regulating the compressor speed according to heat load and ambient conditions.

■ CASE STUDY

Patisserie makes sweet energy savings

Le Breton Patisserie has used $5,000 received under the Energy Efficiency for Small Business Program to halve its refrigeration costs and save $1,700 a year.

Owner Dominic Le Breton has been running his authentic French patisserie in Sydney's lower north shore for 23 years, and has an annual turnover of $250,000. As a program participant, he completed an Energy Action Plan to identify ways to reduce electricity costs.

"Refrigeration was approximately 50 per cent of my energy use and my Energy Action Plan recommended upgrading the bakehouse refrigeration. As a result, I decreased the number of fridges from five to one. This has made a huge difference to the store's energy use," Dominic said.

Dominic reduced energy use by a further 10 per cent by replacing 27 incandescent lights with single fluorescent lighting, and turning off equipment during off-peak baking periods.

"I've also installed time switches to reduce unnecessary lighting use. Since installing these switches and upgrading the lighting, there has been a definite gain in the store's energy efficiency," Dominic said.

"When not in peak baking periods, we switch off equipment that's not in use. We also turn off all equipment at least 30 minutes before closing to make sure nothing is left in standby mode," he said.

Building on these energy savings, Dominic has been inspired to take his efficiencies even further.

"I'm considering generating my own power with solar panels. This will increase the cost efficiency of my future production processes," Dominic said.

"My advice to other businesses considering the Energy Efficiency for Small Business Program is to work out your priorities. I was prepared to outlay $15,000 to update the refrigeration because I wanted to reduce my electricity costs.

"By making changes to the refrigeration and lighting, I've increased the energy efficiency of the store. In the long run, the benefits are definitely worth the upfront cost," said Dominic.

■ CASE STUDY

Green technology good for business

Sydney Masonic Centre (SMC) is a landmark building in Sydney's CBD, operating 16 function and conference rooms across eight floors. Through the Energy Saver Program, SMC has identified opportunities to cut its energy bills by nearly $190,000 a year.

When an energy audit revealed that SMC could cut its electricity bill even further by installing new lighting, Operations Manager Doug Fyfe was delighted.

"With an annual energy bill nudging $300,000, our management team has always been acutely aware of the importance of conserving energy and containing costs," Doug said.

"The energy audit was wonderful because it took our energy initiatives to the next level, especially when it came to the Centre's lighting.

"The recommendations were simply presented, well laid out and clear, which made it easy for our Chief Executive Officer to put forward a business case for remedial works to the Board."

The energy audit identified eight business cases for energy improvements, including:

- installing new energy efficient LED lights
- resetting the chilled water temperature
- changing the speed of the car park exhaust fans
- installing a fresh air cycle in a function room
- installing building systems such as hot water timers, to reduce energy waste.

SMC contributed $4,500 towards the cost of the audit and the works will cost around $600,000, with a three and a half year payback.

Doug considers this money well spent, given the short payback period and the business benefits of improving the building's existing green credentials.

"As a conference and function centre, a green policy is no longer just nice to have; it's a business essential," he said.

"It's something clients expect a venue to have. So not only can an audit identify ways to contain costs and conserve energy, it can also improve your venue's 'sellability'."

■ CASE STUDY

Historic home increases efficiency and comfort

Tudor House was built in 1936, and is an historic landmark in the New England region. The House offers hotel accommodation and is considered a significant tourism attraction for visitors to the Glenn Innes area.

Tudor House participated in an audit under the Energy Efficiency for Small Business program, which identified the main energy using appliances in the hotel as air conditioning and electric hot water systems, as well as lighting and office equipment.

With a $1,400 subsidy, Tudor House installed insulation in the hotel walls and ceilings to reduce energy use by seven per cent and save $476 a year off power bills.

Owner Jenny Carne has been thrilled with the results after completing the insulation project.

"On hot days, when temperatures can get to 40 degrees Celsius and above, I would turn the air conditioning on at around lunch time. Now when the hotel is vacant or when guests have gone out for the day, the air conditioning is turned off," Jenny said.

"Installing the insulation has really improved the comfort of the house – I'm really happy with the result."

Jenny plans to make further savings by replacing incandescent lamps with LED downlights in 11 rooms, to reduce lighting energy use by 78 per cent in each room.

The hotel now plans to replace two electric hot water systems with solar systems to reduce energy use even further and increase bill savings.

Power savings for communities

The NSW Climate Change Fund has provided $6.7 million to 259 energy saving community projects. These projects will help community groups save an estimated 160,000 megawatt hours of electricity and 172,000 tonnes of greenhouse gas emissions in the first 10 years, as well as 119 kilowatts of peak demand. This translates to saving an estimated $2.7 million in annual power bills.

Achievements

Under the Public Facilities Program and the former Energy Savings Fund, the Climate Change Fund allocated $6.7 million to implement 259 energy saving projects for community groups. These projects are estimated to save 160,000 megawatt hours of electricity and 172,000 tonnes of greenhouse gas emissions in the first 10 years, as well as $2.7 million in power bills a year. To 30 June 2011, 136 of these projects have been completed. Power savings by project type are shown in Table 7 below.

The Fund made up to $40,000 available for community organisations to implement simple, low-cost energy and water upgrades in their facilities under the Community Savers stream of the Public Facilities Program. The Fund supported projects to reduce energy consumption and power bills, including lighting upgrades and installing climate-friendly hot water systems, ceiling insulation and skylights. Recipients included not-for-profit pre-schools, aged care groups, sport and recreation clubs, religious facilities, and disability and support services.

Projects are also being implemented through the Demonstration stream of the Public Facilities Program in larger public facilities, including Scout halls, community halls and education centres. The Fund is supporting demonstration projects including insulation, lighting upgrades, optimisation of HVAC and installation chillers. These demonstration projects will implement education initiatives such as practical workshops and events, educational brochures, signage and websites.

The Fund contributed $50,000 to Earth Hour 2011 – a worldwide 'lights-out' hour coordinated by the World Wildlife Fund – to encourage communities to save power and improve sustainability. Of the 27,620 Australian businesses, schools, government agencies and individuals that signed up to the event on Saturday 26 March, around 34 per cent were from NSW. During Earth Hour 2011, Ausgrid estimated a 12 per cent drop in energy use in the Sydney CBD area.

Visit www.environment.nsw.gov.au/grants/ccfund.htm for details of community power savings projects funded under the Climate Change Fund.

Table 7

Community energy saving projects estimated savings and cost-effectiveness by project type (to 30 June 2011)

Project type	No. of projects	Funding allocated ($)	Estimated savings (MWh/yr)	Estimated savings (tCO_2e/yr)	Estimated peak savings (KW)	Estimated bill savings ($/yr)	Cost-effectiveness ($/(MWh x 10 yrs))
Demonstration	7	1,014,792	8,183	8,332	119	1,031,133	12.40
Community Savers	252	5,671,390	7,004	7,718	0	1,375,295	80.98
Total	**259**	**6,686,182**	**15,187**	**16,050**	**119**	**2,406,428**	**44.02**

Table note: does not include water saving projects with associated power savings.

■ CASE STUDY

Wagga Wagga campus targets energy saving and education

Charles Sturt University (CSU) has implemented energy and water saving upgrades across 17 facilities at its Wagga Wagga campus, with the support of $75,000 from the NSW Climate Change Fund.

By installing new energy and water efficient technologies, CSU is saving 206 megawatt hours of energy and 218 tonnes of greenhouse gas emissions a year. The project has a payback period of four years.

The project included installing energy efficient lighting and energy saving modules for air conditioning systems. CSU also installed power factor correction technology to determine how much power its electrical equipment uses. This technology helps the university to effectively identify and monitor energy use onsite.

Edward Maher, Acting Manager of CSU Green, said that the university is committed to reducing its environmental footprint. The university has set a target to reduce its energy consumption by 25 per cent by 2015.

"The outcomes of the project make a significant contribution to these objectives, as well as reducing operational costs of the Wagga Wagga campus," Edward said.

"The project also shows students and staff that the university is actively pursuing its sustainability objectives.

"The university also developed some really engaging case study videos that we are promoting to our student body through our website and Facebook page."

CSU's NSW campuses are located in some of the state's fastest growing regional cities. Wagga Wagga is CSU's largest campus, with around 126,000 square metres of floor area and 224 hectares of campus grounds.

CSU is continuing to pursue its 25 per cent energy reduction target by providing energy efficiency training to its operations and maintenance staff, and implementing a university-wide Building Management Information and Energy Management System.

■ CASE STUDY

Stadium lighting leads the way

Bankstown Basketball Association is the third largest basketball association in NSW, providing the local community with basketball and other social sport programs such as futsal, soccer, volleyball and badminton.

The Association received $40,000 under the NSW Climate Change Fund towards a $60,000 lighting upgrade at the basketball stadium. Energy efficient e5 fluorescent lights were installed to replace the existing high bay lights, saving an estimated 60 megawatt hours of energy a year.

General Manager Alex Bacic said cost increases are a significant challenge for the not-for-profit organisation.

"We undertook an analysis of our electricity use and discovered that our costs were projected to increase by around $17,000 each year," Alex said.

"As a not-for-profit organisation, we need to pass the costs onto our members.

"The funding has allowed us to avoid any cost increases to our participants, the lighting at the stadium has improved, and we are doing our bit to help the environment.

"I've had visitors from a number of other associations, including some from interstate, to see what we have done in the stadium."

The Association has also installed solar power and is currently investigating how to use its expansive roof space to harvest rainwater.

Power savings for government

The NSW Climate Change Fund has provided $27.4 million to 115 energy saving projects to help government facilities save an estimated 371,000 megawatt hours of electricity and 377,000 tonnes of greenhouse gas emissions in the first 10 years, as well as 16,000 kilowatts of peak demand. This translates to saving an estimated $5.8 million in annual power bills.

Achievements

Through the Public Facilities Program, the Schools Energy Efficiency Program and the former Energy Savings Fund, 115 projects are being implemented in schools, local government and state government sites, saving 371,000 megawatt hours of electricity, 377,000 tonnes of greenhouse gas emissions in the first 10 years, as well as $5.8 million in power bills a year. Power savings by government type are shown in Table 8 below.

The Fund provided around $14 million in lighting upgrades at 85 NSW high schools under the $20 million Schools Energy Efficiency Program, jointly managed by the Office of Environment and Heritage and the NSW Department of Education and Communities. The upgrades are expected to save an estimated 41,000 megawatt hours of electricity and 43,000 tonnes of greenhouse gas emissions in the first 10 years, as well as $867,000 on annual power bills.

Energy Savings Action Plans have been completed by 46 local councils that have populations of more than 50,000 people, and 15 government sites that use more than 10 gigawatt hours of electricity a year. Of the cost-effective annual savings of 96,000 tonnes of greenhouse emissions identified in these plans, 49 per cent have been implemented, with estimated savings of $8 million on electricity and gas bills a year. Commonly implemented measures include lighting upgrades, improving HVAC and installing energy efficient appliances.

The Fund is also supporting frontline and iconic state government facilities, with $6.4 million allocated to the Government Building Retrofit Program pilot, which will upgrade water and energy efficiency in government buildings in the Illawarra and Lower Hunter regions, and the Circular Quay Precinct.

To 30 June 2011, 21 assessments have been completed, identifying estimated savings of 19,505 kilolitres of water, 956 megawatt hours of electricity, 3,155 gigajoules of gas, 1,179 tonnes of greenhouse gas emissions, and $242,425 in power and water bills a year. In addition, the Sydney Opera House will save 870 megawatt hours of electricity, 922 tonnes of greenhouse gas emissions and $110,000 in energy bills a year.

Table 8

Government energy saving projects estimated savings and cost-effectiveness by project type (to 30 June 2011)

Project type	No. of projects	Funding allocated ($)	Estimated savings (MWh/yr)	Estimated savings (tCO_2e/yr)	Estimated peak savings (KW)	Estimated bill savings ($/yr)	Cost-effectiveness ($/(MWh x 10 yrs))
Local government	15	5,486,950	18,452	19,292	9,195	2,882,567	29.74
State government	13	7,688,725	14,327	13,813	1,806	2,057,701	53.67
Schools	87	14,270,878	4,099	4,345	9	868,911	348.19
Total	**115**	**27,446,553**	**36,878**	**37,450**	**11,010**	**5,809,179**	**74.43**

Table note: does not include water saving projects with associated power savings.

■ CASE STUDY

Council targets energy guzzlers

Fairfield Council, located in Sydney's south west, received $95,732 under the NSW Climate Change Fund to make the council's leisure centre and Wakeley administration building more energy efficient.

The Council is slashing energy use by 196 megawatt hours a year. The project has a payback period of just over three years.

Hong Nguyen from Fairfield Council said the project is an important part of the Council's Sustain 'n' Save Program that aims to reduce energy consumption and help local business implement energy efficient projects.

"The Council has set a target to cut 20 per cent of its greenhouse gas emissions by 2015," Hong said.

"To meet this target, Council committed to reducing energy consumption at 10 of our highest energy using sites through implementing an energy efficiency program and alternative energy sources."

After completing an Energy Savings Action Plan, the Wakeley administration building and the leisure centre were identified as two of the top energy using sites.

An economy cycle air conditioning system and nine electric heat pump units were installed at the leisure centre to improve the efficiency of the hot water service in the change rooms. The pool pump motors were also replaced with two energy efficient motors, resulting in high energy savings.

The administration building, which includes the Council Chambers and committee rooms, was upgraded with energy efficient lighting.

Hong is delighted with the project results and energy savings, and the improved services for local residents and council staff.

Since completing the project, the council has also implemented water saving projects, such as installing rainwater tanks and water efficient tapware and fittings.

■ CASE STUDY

Chillers cut air conditioning costs

After installing the latest chiller technology to service its air conditioning system, Westmead Hospital has reduced its energy use by at least 11 per cent.

Westmead Hospital, located in western Sydney, is a specialised facility servicing around 1.5 million people. The hospital received $710,000 from the NSW Climate Change Fund to contribute to the $2.7 million air conditioning chiller system upgrade.

The new technology installed at the hospital has reduced the chiller system's energy consumption by around 28 per cent, saving an estimated 5,000 megawatt hours of energy a year.

Glen Hadfield, Manager of Asset Systems and Sustainability at Westmead Hospital said the chillers and fans needed to operate the air conditioning system had to cover 170,000 square metres and were the largest users of energy at the hospital.

"Reliable air conditioning is essential for the hospital and our patient care," Glen said.

"The challenge is the sheer size of the space that requires air conditioning and how we balance the costs associated with it.

"By undertaking this project, we now have a more efficient system, which has significantly cut our energy use," Glen said.

Two new high efficiency chillers and chilled water pumps have been installed at the hospital, to provide chilled water for the air conditioning system. A feature of the new chillers is their ability to operate efficiently at 10 per cent of their peak capacity.

Chilled water pumps circulate cold water to the air conditioning system. The new pumps are more energy efficient due to variable-speed drives, which enable regulation of the chilled water and condenser water flows.

The new system reduces peak demand by 650 kilovolt amperes. This positively impacts the local electricity network, which during summer months often operates near full capacity. As a result of this change in demand by the hospital, the local network operator can delay increasing the local network's capacity.

Water savings

The NSW Climate Change Fund provided $123 million to help households, businesses, community groups and government save an estimated 19.8 billion litres of water and $49 million in water bills a year, through 607 projects, 141,104 residential rebates and 18,855 public housing retrofits.

Water savings for households

With $53.2 million support from the NSW Climate Change Fund, more than 150,000 NSW households are saving an estimated 5.2 billion litres of water and $10 million off water bills a year.

Achievements

To make their homes more water efficient, 141,104 households have taken advantage of NSW Home Saver Rebates for rainwater tanks, water efficient washing machines, dual flush toilets and hot water circulators.

One in three rainwater tanks installed in NSW are now connected to toilets and/or washing machines, compared to almost one in six in 2007.

Water savings for NSW Home Saver Rebates are shown in Table 9 below.

A total of 11 water saving projects for households are being implemented, with $3.8 million funding under the Central Coast Water Savings Fund and the former Water Savings Fund (within Sydney). The projects include installing water efficient fixtures, harvesting rainwater with rainwater tanks and using alternate water sources for laundries, gardens and toilets. These projects will help save 269 million litres of water and more than $556,000 in water bills each year. Nine of these projects have already been completed (to 30 June 2011).

More than 18,000 public housing residents have had their homes fitted with water saving tap valves and showerheads to save an estimated 394 million litres of water and $788,139 in water bills a year.

Sydney Water's demand management initiatives for households are delivering additional savings under the Fund, including WaterFix Residential Retrofits, DIY Water Saving Kits, Love Your Garden and other education campaigns. Visit www.sydneywater.com.au for more details.

Table 9

Water efficient NSW Home Saver Rebates (to 30 June 2011)

Rebate	No. of rebates	Estimated savings (ML/yr)	Estimated bill savings ($/yr)
Rainwater tanks	48,629	2,188.3	4,376,610
Washing machines (ended on 30 June 2010)	76,632	1,839.2	3,678,336
Dual flush toilets	15,829	395.7	791,450
Hot water circulators	14	0.2	476
Total	**141,104**	**4,423.4**	**8,846,872**

■ CASE STUDY

Households get cash back to half flush

Single flush toilets are one of the biggest water wasters in the home, using 12 litres of drinkable water with every flush, even when a full flush isn't needed.

The NSW Climate Change Fund's Dual Flush Toilet Rebate program began on 15 January 2010, offering $200 cash back to households replacing a single flush toilet suite with a new dual flush toilet suite that has a minimum 4-star Water Efficiency Labelling and Standards (WELS) rating.

Installing a dual flush toilet suite with a 4-star WELS rating can reduce water use for a full flush to four and a half litres – three litres for a half flush – saving around 25,000 litres of water a year.

More than 15,800 NSW households received dual flush toilet rebates from 15 January 2010 to 30 June 2011, totalling $3.1 million and saving an estimated 395 million litres of water a year.

The rebate program has also encouraged manufacturers to make more 4-star WELS-rated dual flush toilet models available. There has been a noticeable increase in the number of low-cost dual flush toilet models available to NSW households. The rebate program ended as scheduled on 30 June 2011.

Water savings for businesses

The NSW Climate Change Fund has provided NSW businesses with $31.6 million for 63 water saving projects, to save an estimated 11.5 billion litres of water and $31.3 million off water bills a year.

Achievements

These water saving projects for businesses are being implemented with funds allocated under the Green Business Program, the Central Coast Water Savings Fund and the former Water Savings Fund (within Sydney). To 30 June 2011, 45 of these 63 projects have already been completed.

A range of stormwater and rainwater harvesting, water recycling, groundwater use and water efficiency projects are being funded, including water recovery and reuse from industrial processes and equipment, and using water efficient devices and equipment.

Water savings by project type are shown in Table 10 below.

Water Savings Action Plans have been prepared by 220 business sites in the Sydney Water area that use more than 50 million litres of water a year. Of the cost-effective measures identified in these plans (with estimated water savings of 6.5 billion litres), 53 per cent have already been implemented, with estimated savings of $9.5 million on water bills each year.

Commonly implemented measures include alternate water supplies (waste and industrial process recovery, rainwater harvesting, water recycling and bore water use) and optimising industrial processes.

The first round of the Recycling and Stormwater Harvesting Program, administered by the Metropolitan Water Directorate within the Department of Finance and Services, ran in late 2010, with four business facilities projects offered a total of $1,495,913 to save an estimated 678 million litres of water a year.

Sydney Water's Every Drop Counts Business Program, funded from the NSW Climate Change Fund, is delivering additional water savings. Visit www.sydneywater.com.au for more details.

Table 10

Business water saving projects estimated savings and cost-effectiveness by project type (to 30 June 2011)

Project type	No. of projects	Funding allocated ($)	Estimated savings (ML/yr)	Estimated bill savings ($/yr)	Cost-effectiveness ($/(kL x 10 yrs))
Recycling	31	20,807,808	9,201	24,956,680	0.23
Harvesting	11	2,175,190	179	468,432	1.21
Efficiency	20	6,933,765	2,003	5,390,899	0.35
Groundwater	1	1,661,507	160	437,600	1.04
Total	**63**	**31,578,270**	**11,543**	**31,253,611**	**0.27**

Table note: does not include power saving projects with associated water savings

■ CASE STUDY

Woolies saves thousands on water bills

Australia's largest supermarket chain Woolworths Limited has used $150,000 from the Central Coast Water Savings Fund to implement a rainwater harvesting project at its Wyong Regional Distribution Centre, located on the NSW Central Coast.

The Woolworths Wyong Regional Distribution Centre supplies groceries to a number of stores in the local area. The centre has a constant and high water demand to operate its bank of onsite cooling towers.

Four 260,000 litre water tanks have been installed to harvest rainwater from the centre's expansive flat roof for reuse in the cooling towers. Captured water is also used for toilet flushing and site irrigation, as well as emergency use for the local Rural Fire Service.

An estimated 20.8 million litres of potable water is being saved, captured and reused each year at the site. The project has also reduced water costs by almost $20,000 in the first year.

Woolworths Environmental Manager Kane Hardingham said that by harvesting rainwater, the distribution centre can reduce its potable water demand and guarantee a sustainable water supply.

"Woolworths has made a public commitment to reduce water use in its facilities and this project contributed to our overall water savings of 342 million litres," he said.

This project is one of three rainwater harvesting projects Woolworths has implemented nationally.

■ CASE STUDY

Snack Brands slashes water use

Arnott's Snack Brands Australia has saved over 54 million litres of drinking water a year by installing recycling technology to treat and reuse wastewater at its Smithfield factory.

Snack Brands Australia is one of the largest suppliers of snack foods in Australia and includes the brands Thins, Samboy, CC's, French Fries and Cheezels.

A $925,000 grant from the NSW Climate Change Fund enabled Arnott's to reuse potato washing water. Used water is filtered through a membrane and treated with an antimicrobial biocide, so it can be returned to production for reuse.

Michael Brotherton, Waste and Environmental Coordinator at Arnott's Snack Brands Australia said that the project is helping the company achieve its Australia-wide target of reusing more than 90 per cent of the water used in its production operations.

"This project has helped our Smithfield factory save water, and helps meet our economic and environmental objectives," he said.

Further water savings are expected at the Smithfield factory through improved water treatment and plant operation.

Water savings for communities

The Fund provided $15.3 million for 245 water saving projects to help community groups save an estimated 14 billion litres of water in the first 10 years, and $3.5 million in annual water bills.

Achievements

A total of 245 water saving projects for community groups are being implemented with funds from the Public Facilities Program, the Central Coast Water Savings Fund and the former Water Savings Fund (within Sydney). To 30 June 2011, 141 of these projects have already been completed.

Up to $40,000 was available for community organisations to implement simple, low-cost energy and water upgrades in their facilities. Funded water saving projects include upgrading and retrofitting bathroom amenities, installing rainwater tanks and recycling water for irrigation. Organisations undertaking these projects include pre-schools, aged care groups, sport and recreation clubs and disability and support services.

Demonstration projects are being implemented in larger public facilities, including community halls and leisure centres. Funded projects include upgrading taps and toilets, harvesting rainwater, recycling water for irrigation and installing rainwater tanks. Other demonstration initiatives include practical workshops and events, educational brochures, signage and websites.

Water savings by project type are show in Table 11 below.

Visit www.environment.nsw.gov.au/grants/ccfund.htm for details of water saving projects funded under the NSW Climate Change Fund.

Table 11

Community water saving projects estimated savings and cost-effectiveness by project type (to 30 June 2011)

Project type	No. of projects	Funding allocated ($)	Estimated savings (ML/yr)	Estimated bill savings ($/yr)	Cost-effectiveness ($/(kL x 10 yrs))
Recycling	13	5,229,863	772	2,058,451	0.68
Harvesting	161	6,539,977	383	944,793	1.71
Efficiency	69	3,018,404	110	230,140	2.75
Groundwater	2	498,720	38	86,333	1.32
Total	**245**	**15,286,964**	**1,303**	**3,319,717**	**1.17**

Table note: does not include power saving projects with associated water savings.

■ CASE STUDY

Bowling Club cuts dependence on town water

The Robertson Bowling Club is the prime social and sporting club in the picturesque Southern Highlands village.

A $172,000 NSW Climate Change Fund grant has helped the club replace the grass bowling green with an artificial woven surface to reduce the need for watering. The club has also installed waterless woks that could reduce the club's water use by up to 90 per cent, and four 10,000 litre tanks to collect rainwater for use in toilets and urinals. Ten single flush toilets have been replaced by dual flush models.

With estimated water savings of around 800,000 litres a year, the project will reduce the club's reliance on town water by around 75 per cent and make at least an additional $15,000 available to support other community projects.

Club President Warrick Mitchell said that the original bowling green was costing at least $50,000 each year in water, chemical and maintenance costs.

"When the original project was being compiled, it was immediately clear that other benefits could be derived from the collection and storage of rainwater and the proper use of that water," Warrick said.

The new green can be used more often, due to fewer maintenance requirements and quicker drainage after rainfall. Local schools can now pursue bowling as a sporting option.

The first of its kind in the district, the project has been getting a lot of attention from bowlers and non-bowlers. "I would not be surprised to see many smaller bowling clubs follow our lead in having a synthetic green for both environmental and financial reasons," Warrick said.

The club has also organised an environmental art competition for local schools to help spread the message about the water saving project.

■ CASE STUDY

Community benefits from reusing groundwater

Cumberland Country Golf Club, at Greystanes in Sydney's west, has secured a reliable water source by reusing groundwater from a local quarry, saving an estimated 55.9 million litres of drinking water each year.

With a grant of $398,250 from the NSW Climate Change Fund, the club installed a pumping station at the nearby Boral quarry and laid a four kilometre pipeline to reuse the groundwater at the site.

The club first took action on water use when its financial viability was threatened during a drought and subsequent water restrictions. General Manager Ian Cottle said the course was deteriorating due to the lack of water, and the club was losing members.

"We didn't have access to water other than the mains supply and the onsite dams only provided about 30 per cent of our water needs," Ian said.

"The Board decided to undertake an extensive water resources study to find out how we could fix the problem."

The study identified ways to improve the storage of water onsite and how to control usage. The club also completed a Water Savings Action Plan, which identified 700,000 litres of water savings that could be made at the clubhouse and in the greenkeeper's shed.

After an extensive search to find alternative water sources, the club discovered the nearby Boral quarry was discharging approximately 2 million litres of useable groundwater each day into a local creek. It decided to build a pipeline to redirect this water.

According to Ian, the pipeline project has helped secure the club's future by providing a reliable water source, as well as benefiting the local community.

"We were able to build the pipeline to also provide irrigation for the council's local parks and Greystanes Primary School," he said.

"It's great for our club to work with industry, council and government in such a positive way to benefit the community and solve a number of water issues.

"We have learnt firsthand how a lack of water can affect community facilities and an asset such as a golf course.

"The Board now regularly reviews the club's water usage and we have developed policies relating to water use and its conservation."

■ CASE STUDY

University tackles high water use

The University of New South Wales (UNSW) received $131,065 from the NSW Climate Change Fund's Public Facilities Program to roll out water saving initiatives at its Kensington campus.

UNSW is considered one of Australia's largest research institutions and provides tertiary education to over 50,000 students. It took action to reduce water consumption after being identified as one of the top water users in NSW.

The university identified numerous water saving actions after completing a Water Savings Action Plan in 2007.

UNSW is now saving an estimated 7 million litres of drinking water at the Lifestyle Centre, which has 40,000 visitors each month. The project has a payback period of less than 18 months.

Ray Filetti, Energy Manager at UNSW, said that because of the activities carried out in the Lifestyle Centre, it is one of the more water intensive buildings on the Kensington Campus.

"The centre operates a pool, gymnasium and squash courts for student, teacher and community use," he said.

To save water, an ultraviolet water treatment system was installed, as well as shower timers, waterless urinals and sensor taps. A solar-boosted gas hot water system and a thermal cover on the pool's sand filter also reduce energy use, and water pipes have been modified to reduce wastewater.

UNSW has installed a series of interactive touchscreens, storyboards and instruction signs to engage and educate the Lifestyle Centre's patrons. Ray encourages anyone taking on a sustainability project to engage with their stakeholders and the community.

"Probably one of the biggest lessons learned is the impact that patron behaviour has on the final energy and water savings," he said.

The university has continued to save water by implementing the Borewater Treatment Plant project, also at the Kensington campus. The project was also identified under the Water Savings Action Plan and was supported by $747,000 from the NSW Climate Change Fund's Water Savings Fund.

Reusing collected and treated groundwater in the UNSW laboratories is also saving more than 82 million litres of drinking water a year.

A 10 kilowatt photovoltaic system has also been installed on the roof of the swimming pool building to offset the energy use by the new ultraviolet water treatment system. It has generated more than 18,000 kilowatt hours of energy since January 2010.

■ CASE STUDY

Children help look after our environment

SDN Children's Services (SDN) provides early childhood learning services for children from birth to five years of age.

The not-for-profit organisation received $40,000 from the NSW Climate Change Fund to upgrade inefficient tapware with sensor taps and old cisterns with modern, water efficient systems, to save 900,000 litres of water a year.

Carol Soleymanbik, Centre Director at SDN, said that dripping taps and the water wasted through inefficient toilet cisterns had been a concern.

"The children were not able to securely turn the old taps off, but once the new sensor taps were installed the children were intrigued," she said.

"We also taught them about using the half and full flush on the new toilets.

"The sensor taps have the additional benefit of further improving the infection control measures already in place."

SDN has expanded its sustainability learning to include reducing food waste. A kitchen garden is being added to the centre, equipped with a compost bin and worm farm.

Water savings for government

The Fund has provided $22.8 million for 288 water saving projects to help local government, state government and schools save an estimated 17 billion litres of water in the first 10 years, and $4.3 million in annual water bills.

Achievements

These 288 water saving projects are being implemented with funds allocated under the Public Facilities Program, the Central Coast Water Savings Fund, the former Water Savings Fund (within Sydney) and the Rainwater Tanks in Schools Program. To 30 June 2011, 45 of these projects have already been completed.

Water Savings Action Plans have been prepared by 44 councils and 34 government sites in the Sydney Water area that use more than 50 million litres of water a year. Cost-effective measures identified in these plans would save 1.8 billion litres of water if implemented. Twenty-eight per cent of these measures have been implemented, saving an estimated $1.4 million on water bills a year. Commonly implemented measures include upgrading and retrofitting amenities, monitoring leakage, harvesting rainwater and improving the efficiency of irrigation systems.

The Rainwater Tanks in Schools Program provided 218 schools with funding to install rainwater tanks. The Fund also provided an additional 182 schools across the state with funding for water audits and monitoring, and for installing water efficient taps, bubblers, bubbler cages and dual flush toilets.

Sydney Water's Every Drop Counts Schools Program is delivering additional water savings. Visit www.sydneywater.com.au for more details.

The Recycling and Stormwater Harvesting Program, which is administered by the Metropolitan Water Directorate within the NSW Department of Finance and Services, provides $13 million to support potential recycled water suppliers, distributors and customers to help them develop localised recycling and stormwater harvesting schemes. The first round of the Recycling and Stormwater Harvesting Program ran in late 2010, with funding totalling $3,853,300 offered to six projects at local council owned parks, reserves and sports fields, to save an estimated 319 million litres of water a year.

Government water savings by project are shown in Table 12.

The NSW Government's Water for Life Education Program, coordinated by the NSW Office of Water, receives $2 million a year from the NSW Climate Change Fund. This program delivers and coordinates social marketing campaigns, on-the-ground water education projects and community consultation, and provides training and resources for councils and non-government organisations.

Visit www.waterforlife.nsw.gov.au for more information on this program.

Table 12

Government water saving projects estimated savings and cost-effectiveness by project type (to 30 June 2011).

Project type	No. of projects	Funding allocated ($)	Estimated savings (ML/yr)	Estimated bill savings ($/yr)	Cost-effectiveness ($/(kL x 10 yrs))
Local government	53	13,839,485	1,145	2,936,053	1.21
State government	6	1,303,459	101	274,342	1.29
Schools	229	7,642,102	397	1,056,828	1.92
Total	**288**	**22,785,046**	**1,643**	**4,267,223**	**1.39**

Table note: does not include power saving projects with associated water savings.

■ CASE STUDY

Greening Sydney's north

Ku-ring-gai Council, located in Sydney's north, has received $1.43 million for three water saving projects in its local government area – Roseville Chase Oval, Gordon Golf Course, and St Ives Showground and Nursery – to save up to 138 million litres of water a year.

The Roseville Chase Oval project received $112,900 to install underground drainage. Excess water from irrigation and rainfall is now directed to a dam located on the neighbouring golf course. A storage tank and reticulation system have been installed so the collected water can be used to irrigate the oval and flush the toilets.

The community now enjoys an improved playing surface with higher availability as a result of improved drainage. The council is saving 2.7 million litres of water a year and has virtually eliminated using drinking water for irrigation at the site.

St Ives Showground and Nursery received funding of $488,600 to deliver treated water for reuse through a leachate treatment plant and reticulation network.

The showground and nursery is saving 11 million litres of water a year by collecting leachate from a disused green-waste tip, and reusing it for toilet flushing and irrigation. The treatment plant also provides a solution to the disposal of leachate.

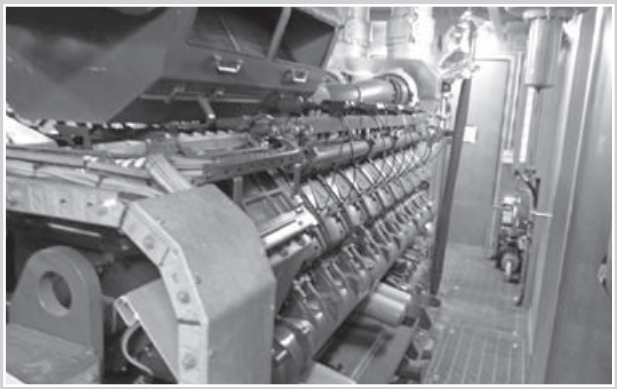
Ku-ring-gai Council's Environmental Engineer Jay Jonasson said the council is already benefiting from these water saving projects.

"Having access to an alternative water supply ensures that we can keep our community facilities in good condition without using precious drinking water," Jay said.

The council's third project, received $831,500 in funding to construct a sewer mining plant at Gordon Golf Course. Sewage from under the golf course will be extracted and treated through a membrane bioreactor and reused to irrigate the course. The project, which is in its final stage of completion, could save up to 125 million litres of water a year.

Clean energy

The NSW Climate Change Fund is stimulating investment in clean energy technologies in NSW by providing $31 million in funding to commercialise emerging technologies, and offer additional support for proven technologies such as wind and solar power.



Supporting proven technologies

Achievements

The Fund provided $6 million for seven clean energy projects with proven technologies under the Public Facilities Program and the former Energy Savings Fund. These projects will help generate more than 14,000 megawatt hours of electricity a year and save 15,300 tonnes of greenhouse gas emissions and $2.1 million on electricity bills annually. Three of these projects have been already completed.

These projects include harnessing methane gas from animal effluent and sewage, and installing mini hydro-generators and photovoltaic panels. These are proven technologies that are not yet deemed cost-effective. The Fund is helping to overcome the major barrier to investment by bridging the gap between the upfront cost of investment in this generation and the savings on energy bills.

The Fund also allocated $3.1 million to 10 projects that are installing photovoltaic panels and power and water saving technologies. These projects include 'greening' community centres, schools and public buildings.

NSW is positioning itself to attract substantial new renewable energy investment by creating six Renewable Energy Precincts. These precincts have been established in areas of the state where significant future renewable energy development is expected: the New England Tablelands, the Upper Hunter, the Central Tablelands, the NSW–Australian Capital Territory border region, the South Coast and the Snowy–Monaro region. These precincts are part of a community partnership designed to support local community engagement in renewable energy development. The Fund provided $1.25 million in 2010–11 to support these precincts.

On 18 June 2011, the NSW and Australian Governments jointly announced Moree Solar Farm Pty Ltd – a consortium led by BP Solar, Fotowatio Renewable Ventures and Pacific Hydro – as the first-round photovoltaic winner of the Solar Flagships Program. The consortium will build a 150 megawatt photovoltaic power plant in Moree, in northern NSW. When finished, it will be one of the largest solar plants in the world and will provide enough electricity for about 45,000 homes; roughly the number of homes in a city like Darwin.

Construction of the Moree Solar Farm will start in 2012 and will be fully commissioned in 2015. The project will create hundreds of jobs, and will cost an estimated $923 million. The NSW Government is currently negotiating a Funding Deed with Moree Solar Farm, which will govern how and when the consortium receives NSW Government funding.

Visit www.environment.nsw.gov.au/grants/ccfund.htm for details of clean energy projects funded under the NSW Climate Change Fund.

■ **CASE STUDY**

Brewery makes its own electricity

Lion Nathan is now generating its own electricity after completing a cogeneration plant at its Toohey's Brewery in Lidcombe. Lion Nathan received $2 million from the NSW Climate Change Fund's Green Business Program, contributing to the $4.2 million natural gas-fired cogeneration plant.

The alternative power generation consists of a natural gas-fired engine that powers a 2 megawatt electrical alternator to produce electricity. The cogeneration plant operates 24 hours a day, seven days a week, significantly reducing the brewery's demand on the electricity grid.

The plant has the capacity to generate 17,000 megawatt hours of electricity each year, and is estimated to save 15,000 megawatt hours of grid electricity and 10,900 tonnes of carbon pollution a year. The project will also save $700,000 in power costs a year, even after budgeting for ongoing maintenance and natural gas costs.

Lion Nathan Engineering Reliability Manager Fred Sadie said the company has been thrilled with the results of the project.

"After resolving several commissioning issues, the project is now over-delivering in terms of payback, due to electricity costs rising more than anticipated at the time of project approval," he said.

"We are more confident about delivering cost-effective and environmentally responsible products in the future."

The plant is popularly known as a tri-generation plant, because it generates electrical energy and heat energy for steam and chilled water. The chilled water and steam assist in the beer-making process, and provide energy and water efficiencies at the brewery.

Emerging technologies

Achievements

The Fund provided $24.8 million to six large-scale projects for commercialising emerging technologies that will generate power or reduce grid power use by an estimated 96,000 megawatt hours. This will save around 102,000 tonnes of greenhouse gas emissions a year.

These projects include applying geothermal, solar thermal and biogas (energy from animal-waste methane) technologies to generate electricity, as well as enabling technologies to store wind-generated energy, and testing the potential for small-scale urban wind farms.

The projects are funded through the Renewable Energy Development program, which supports technologies that are not yet market-ready. Early movers in new technology are often deterred or delayed by having to bear the costs of trailblazing new products without being able to prevent subsequent competitors from taking advantage of their work.

■ **CASE STUDY**

Solar power chills shopping centre

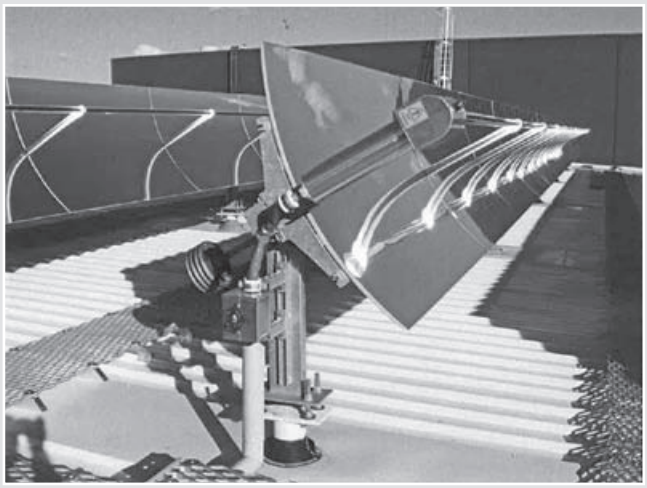
Property owner The GPT Group has commissioned Australia's first solar thermal system to cool the Charlestown Square shopping complex in NSW's Hunter region.

The GPT Group received $500,000 funding from the NSW Climate Change Fund to implement the solar thermal system. The CSIRO Energy Transformed Flagship supported the application for funding as a means of demonstrating solar cooling technology on a commercial scale.

The rooftop system consists of 12 rows of curved mirrors, each about 30 metres long, which focus the sun's radiation onto oil-filled pipes. The oil heats up in the pipes and transfers the heat energy to a water tank below, called the buffer tank. Hot water from the tank circulates through the adjacent absorption chiller to generate chilled water for the air conditioning system. To maximise efficiency, a two-stage chiller was installed instead of the single-stage chiller originally planned, achieving around 30 per cent increased efficiency.

The solar thermal system is estimated to save 77 megawatt hours of electricity and 82 tonnes of greenhouse gas emissions a year.

The system generates its maximum output of 160 kilowatts during hot weather, which coincides with peak demand on the EnergyAustralia network, due to the high air conditioning load. The local network operates near its maximum capacity in hot weather, so the solar thermal system will reduce peak summer electricity demand.



Development Manager, Sustainability and Operations, The GPT Group said the integration of solar thermal and cogeneration technology into Charlestown Square's design have overarching strategy objectives, which include providing future diversity in regards to energy pricing and reductions in the centre's use of carbon based energy.

"GPT's aim is to progress this technology in real commercial applications, by selling electricity to retailers, while reducing the centre's electricity demand and consumption from the grid." he said.

Solar Bonus Scheme Reimbursement Program

The NSW Climate Change Fund is helping households and small businesses adopt renewable energy technologies under the Solar Bonus Scheme.

Solar Bonus Scheme Reimbursement Program

The Solar Bonus Scheme provides a feed-in tariff to eligible households and small businesses that install small-scale renewable energy systems connected to the electricity network, such as solar photovoltaic and wind turbines. The scheme is administered by the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS).

The Fund is the payment vehicle for the scheme through the Solar Bonus Scheme Reimbursement Program, by repaying distribution network service providers Ausgrid, Essential Energy and Endeavour Energy for the expense they incur by making tariff payments. In 2010–11, the Fund provided $138 million under the program.

The objectives of the Solar Bonus Scheme are to:

- provide an additional means of support to NSW electricity customers who wish to generate renewable energy locally
- build the state's 'green collar' jobs sector, by helping solar technology compete with non-renewable energy sources
- expand the visibility of renewable energy technologies to help motivate the whole community in responding to climate change.

The seven-year scheme started on 1 January 2010 and is scheduled to finish on 31 December 2016. When the scheme began, a tariff rate of 60 cents per kilowatt hour of electricity generated was available for eligible systems, fixed for the life of the scheme. Following a rapid uptake of connections, a review of the scheme recommended lowering the tariff rate. Applications received after 27 October 2010 were therefore eligible for a tariff of 20 cents per kilowatt hour. The scheme was closed to new applications on 28 April 2011.

To 30 June 2011, more than 124,000 systems are connected to the scheme.

Visit www.trade.nsw.gov.au/energy/sustainable/renewable/solar/solar-scheme for more information on the Solar Bonus Scheme.

Coal Innovation NSW Fund

The Coal Innovation NSW Fund is investing $100 million over four years researching, developing and commercialising clean coal technologies in New South Wales.

Coal Innovation NSW Fund

Achievements

The *Coal Innovation Administration Act 2008* established the Coal Innovation NSW Fund (the Fund) and Coal Innovation NSW, the body which provides advice and recommendations to the Minister for Resources and Energy in the administration of the Fund. The Fund is administered by the Division of Resources and Energy within the Department of Trade and Investment, Regional Infrastructure and Services (DTIRIS).

The NSW Government has committed $100 million over four years to the Coal Innovation NSW Fund, which provides funding:

- to help research and develop clean coal technologies
- to demonstrate clean coal technologies
- to increase public awareness and acceptance of the importance of reducing greenhouse gas emissions through the use of clean coal technologies
- for the commercialisation of clean coal technologies.

Key areas on which the Coal Innovation NSW Fund continues to focus are:

- the Delta Carbon Capture and Storage Demonstration Project
- the State-Wide Assessment of CO_2 Storage Capacity Project
- expressions of interest for research and development projects.

Delta Carbon Capture and Storage Demonstration Project

Along with the Commonwealth Department of Resources, Energy and Tourism (DRET) and ACA Low Emissions Technologies Ltd (ACALET), the Coal Innovation NSW Fund signed a funding agreement with Delta Electricity for the development and approvals phase (Stage 1) of the project. The Coal Innovation NSW Fund approved $9.43 million for this stage.

Once complete, the project will demonstrate post-combustion capture, transport and permanent geological storage of carbon dioxide (up to 100,000 tonnes of CO_2 per annum in a saline aquifer) from a black coal power station.

State Wide Assessment of CO_2 Storage Capacity Project

The Coal Innovation NSW Fund has developed a business plan with two aims: to identify storage by 2012 and to undertake a state-wide assessment of potential storage opportunities. DTIRIS, DRET, ACALET and the Coal Innovation NSW Fund have negotiated funding agreements, which are waiting to be signed.

DTIRIS engaged drilling contractors to gather pre-competitive data to determine NSW's potential geological storage for CO2. Four sites in the Sydney Basin have been explored and tested; final reports of these investigations are still pending.

In 2010–11, project expenditure was $6 million.

Expressions of interest for research and development projects

A call for expressions of interest under the Coal Innovation NSW Fund (then the NSW Clean Coal Fund) closed on 4 December 2009, with 29 project applications received and assessed. In May 2010, 10 successful projects were allocated funding of $13 million. One project withdrew its application in December 2010.

Eight funding agreements have been signed and projects are in the early stages of development. Project details are outlined in Table 13.

Table 13

Approved projects for the Coal Innovation NSW Fund – May 2010

Applicant	Brief project description	Funding, up to ($)	Duration (years)
University of Newcastle and GreenMag Group [1]	Mineral carbonation	3,040,000	3.5
UCC Energy P/L	UCC burning efficiency	2,581,000	4
Centennial Coal (Mandalong) P/L	Fugitive emissions (ventilation)	2,200,000	2
CSIRO	Capture testing solvents	1,300,000	3
CSIRO	Fugitive emissions (open cut)	1,000,000	2
University of Newcastle	Chemical looping – oxyfuel	886,618	3
University of Newcastle	Social research/public awareness	618,930	2
CSIRO	Novel capture and energy efficiency	613,711	1.5
University of Newcastle	Direct carbon fuel cell	608,719	5.5
ourSUN P/L [2]	Combined Brayton–Rankin cycle	159,200	7 mths
	Total	**13,008,178**	

[1] University of Newcastle and GreenMag Group are yet to sign their funding agreement.

[2] ourSUN P/L withdrew its application on 1 December 2010.

Source: Department of Trade and Investment, Regional Infrastructure and Services.

Administration and budget

Administration and the Australian Energy Market Commission

Governance arrangements

Under the *Energy and Utilities Administration Act 1987* (the Act), the Minister for the Environment approves payments from the NSW Climate Change Fund if satisfied that projects promote a purpose referred to in the legislation. The Fund is administered by the Office of Environment and Heritage (OEH).

An evaluation panel with an independent chair and members with relevant industry and technical expertise assesses contestable grants under the Fund. OEH conducts technical assessments of all applications received, to assist the evaluation panel in its assessments. Applications are assessed according to set selection criteria, given in the relevant publicly available Guide for Applicants. The evaluation panel makes recommendations on funding to the Minister.

Principles for administering the Fund

OEH applies the following key principles in administering the Fund:

- funding allocations and expenditure will ensure responsible financial management
- a strategic approach will be used in setting priorities for expenditure
- the detailed priority setting process and fund allocations will closely follow strategic government policy (including the election commitment of the NSW Climate Change Fund, the NSW State Plan and the NSW Energy Efficiency Strategy).

OEH will:

- regularly assess and review outcomes achieved through expenditure
- provide a program of regular reporting to provide oversight of the Fund
- establish strong accountability and adhere to clear corporate governance principles.

Evaluation and reporting

Funding recipients must report on the progress of projects and their success in achieving anticipated outcomes (e.g. water and/or energy and greenhouse gas savings). In the case of residential rebates, recipients must provide receipts to validate purchase and installation details.

The Fund is committed to keeping the NSW community fully informed about its progress in achieving its climate change goals, and its expenditure and achievements under the Fund. OEH reports regularly on its progress in meeting its NSW State Plan emissions target and publishes information on the range of funding available, as well as projects that have been awarded funding under the Fund.

The Australian Energy Market Commission

The Fund provides NSW's contribution to national energy regulation initiatives, as provided for under section 34H of the Act. In 2010–11, NSW paid $5.2 million as its share of the Australian Energy Market Commission's (AEMC's) annual operating budget. Under established funding arrangements agreed between relevant jurisdictions, NSW is responsible for 37.5 per cent of the AEMC's budget.

The AEMC was established in July 2005 by the Council of Australian Governments, through its Ministerial Council on Energy. The AEMC is the national body responsible for rulemaking, market development and policy advice with regard to the National Electricity Market. From 1 July 2008, the AEMC is also responsible for access to natural gas pipeline services and elements of the broader natural gas markets. The Ministerial Council on Energy (on which the NSW Minister for Resources and Energy sits) approves the annual budget for the AEMC.

The Fund also contributed $1.18 million in 2010–11 on behalf of OEH and the NSW Office of Water (NOW) to the Energy Efficiency Working Group of the Ministerial Council on Energy, to support national energy efficiency initiatives. The Federal Department of Resources, Energy and Tourism administers funds for the Ministerial Council on Energy.

Budget and spending status

Revenue

Electricity distributors and water utilities were required to make contributions to the Fund through annual contribution orders, gazetted on 9 July 2010 for energy and on 29 May 2011 for an amendment to the water order. A breakdown of the NSW Climate Change Fund's 2010–11 revenue is shown in Table 14.

Expenditure

The Fund's expenditure in 2010–11 was $285.6 million. The proportion of program administration expenditure was 2 per cent. Expenditure for each of the components of the Fund is presented in Table 15.

Table 14

NSW Climate Change Fund 2010–11 revenue

Source	Amount ($)
Ausgrid	70,996,779
Endeavour Energy	44,678,536
Essential Energy	34,774,301
Sydney Water	23,309,780
Gosford City Council	1,050,000
Wyong Shire Council	950,000
Interest	6,285,202
Miscellaneous revenue[1]	1,382,344
Subtotal	**183,426,942**
Treasurer's advance for the Solar Bonus Scheme	27,410,000
Total funds	**210,863,942**

Table 15

NSW Climate Change Fund 2010–11 expenditure

Program/component	Recipient	Expenditure ($, GST excluded)
Home Saver Rebates Program	Households	25,511,888
Green Business Program	Businesses	2,309,521
Public Facilities Program	Various	6,411,906
Renewable Energy Development Program	Business	8,790,278
Recycling and Stormwater Harvesting Program	Office of Water	1,500,000
Schools Energy Efficiency Program	Schools	5,864,469
Central Coast Water Savings Fund	Various	403,504
Water and Energy Savings Projects	Various	7,399,527

NSW Climate Change Fund 2010–11 expenditure (cont.)

Program/component	Recipient	Expenditure ($, GST excluded)
Energy Efficiency Strategy		
• Energy Efficiency for Small Business Program	Businesses	6,378,324
• Sustainability Advantage Energy Saver	Businesses	3,569,395
• Green Skills Program	Various	3,475,861
• Energy Efficiency Community Awareness Program	Various	5,367,283
• Home Power Savings Program	Households	10,559,800
• Government Energy Efficiency Team Program	OEH	102,929
• Energy Efficiency Data Collection Program	OEH	427,907
Metropolitan Water Education Program	Office of Water	2,000,000
Sydney Water Demand Management Program	Sydney Water	6,724,891
Australian Energy Market Commission (for national energy regulation purposes)[2]	AEMC	6,365,122
Public housing retrofits	Housing NSW	3,410,000
Rainwater Tanks in Schools Program	DEC	5,632,000
Solar Bonus Scheme Reimbursement[3]	DNSPs	138,253,239
Government Water and Energy Programs	Businesses/government	1,636,253
Coal Innovation NSW Fund	DTIRIS	25,141,622
NSW Climate Change Fund administration (includes Home Saver Rebates Program administration and administration of Savings Action Plans	OEH	6,204,185
Total		**283,439,904**

[1] Includes reimbursement from NOW for its contribution of $553,054 to Minimum Energy Performance Standards.

[2] Includes OEH's contribution of $627,724 and NOW's contribution of $553,054 to the Energy Efficiency Working Group (E2WG).

[3] The Solar Bonus Reimbursement Scheme payment made to distribution network service providers was in part provided from the Fund's contribution orders, and part by direct Treasurer advance, in accordance with s34G(1)(b)of the *Energy and Utilities Administration Act 1987*. This advance is being accounted for in accordance with direction from NSW Treasury and Accounting Standards for interest free loans.

Appendices

Appendix A Legislative requirements

The NSW Climate Change Fund (the Fund) was established in 2007 under the *Energy and Utilities Administration Act 1987* (the Act). The Act describes the purposes of the Fund and a number of other requirements.

Relevant provisions in the legislation are provided below.

Division 2 – Climate Change Fund

34F Purposes of Climate Change Fund

The purposes of the Fund are as follows:

(a) to provide funding to reduce greenhouse gas emissions and the impacts of climate change associated with water and energy activities

(b) to provide funding to encourage water and energy savings and the recycling of water

(c) to provide funding to reduce the demand for water and energy, including addressing peak demand for energy

(d) to provide funding to stimulate investment in innovative water and energy savings measures

(e) to provide funding to increase public awareness and acceptance of the importance of climate change and water and energy savings measures

(f) to provide funding for contributions made by the State for the purposes of national energy regulation.

34G Payments into Climate Change Fund

(1) There is payable into the Fund:

(a) all money received from contributions required to be made to the Fund under Division 3 and

(b) all money advanced by the Treasurer for the Fund and

(c) all money appropriated by Parliament for the purposes of the Fund and

(d) the proceeds of the investment of money in the Fund and

(e) all money directed or authorised to be paid into the Fund by or under this or any other Act or law.

(f) all money received from voluntary contributions to the Fund made by any other person or body.

(2) Without limiting subsection (1) (f), State agencies are authorised by this section to make voluntary contributions to the Fund.

(3) Subsection (2) does not authorise a State water agency or a distribution network service provider to refuse to pay a contribution to the Fund that is payable under Division 3.

34H Payments out of Climate Change Fund

(1) There is payable from the Fund:

(a) any money approved by the Minister to fund all or any part of the cost of any measure that the Minister is satisfied promotes a purpose referred to in section 34F, and

(b) any money approved by the Minister to fund all or any part of the contributions that the State is required to make for the purposes of national energy regulation and

(c) any money required to meet administrative expenses related to the Fund and

(d) any money required to meet administrative expenses of the Minister in connection with the Minister's functions under this Act in relation to savings action plans and

(e) any money directed or authorised to be paid from the Fund by or under this or any other Act or law.

(2) In exercising the Minister's functions under subsection (1) (a) (but without limiting the generality of that paragraph), the Minister may:

(a) approve selection criteria from time to time to be applied to determine the kinds of water or energy savings measures that will be eligible for funding and

(b) approve the funding of community grants from the Fund, being grants awarded on the basis of their merit in advancing one or more of the purposes referred to in section 34F, established through a competitive selection process and

(c) require a person or body seeking funding for a water or energy savings measure to do either or both of the following as a precondition to applying for or obtaining funding:

(i) to submit a water savings action plan or energy savings action plan (as the case requires) that includes details about the measure

(ii) to provide any other information requested by the Minister about the measure

and

(d) obtain and have regard to any advice, recommendations or other information provided to the Minister by a committee established by the Minister under Division 5, or by any other person or body, that the Minister considers relevant.

(3) The Minister is to produce an annual report detailing fund allocations and programs and anticipated benefits, by reference to key performance indicators, to be achieved in advancing any one or more of the purposes referred to in section 34F

(4) The annual report is to include an evaluation of the effectiveness of each program as it is completed under the Fund

(5) The annual report is to be tabled in each House of Parliament within six months after the end of the financial year to which it relates

(6) The Minister is to publish each annual report so as to promote, to the NSW public, schemes, technologies and processes that address climate change and to inform the NSW public about consumer choices and procurement decisions.

Appendix B Tariffs and data sources

Table B1

Energy and water tariffs 2011–12 (at current prices)

Utility	Year	Sector	Tariffs	Units	Source notes
Electricity	2011–12	Residential Business[1] Government[2] Community[3]	26.5 13.2 to 24.4 15.9 to 21.2 13.2 to 24.4	c/kWh	Residential tariffs include GST. Business, community and government tariffs are ex-GST. Data sources include price guides from suppliers/retailers (EnergyAustralia, Integral Energy, Country Energy, AGL, ActewAGL, Origin); government electricity and gas contracts; and reports and consumption data from various government agencies, including the Independent Pricing and Regulatory Tribunal (IPART).
Natural gas	2011–12	Residential Business[1] Government[2] Community[3]	17.8 12.6 12.6 17.8	$/GJ	
Water[4]	2011–12	Residential Non-Residential	1.50 to 2.10 1.36 to 2.74	$/kL	Standard rates (Sydney, Hunter, Central Coast and Rous Water Utilities 2011–12) Standard rates +0.5 wastewater charges (Sydney, Hunter, Central Coast and Rous Water Utilities 2011–12)

[1] Calculated tariffs for small, medium, large and very large businesses, based on threshold baseline consumption.

[2] Calculated tariffs for education (DET, schools and TAFEs), non-education (health) and other government organisations.

[3] Calculated tariffs for non-government schools and non-government (small, medium and large) organisations.

[4] Calculated tariffs for projects/programs covered by the major water utility areas: Sydney, Hunter and Central Coast. Rous Water tariffs have been applied to the remainder of the state.

Fridge Buyback figures do not include the number of fridge collections or savings from the pilot phases, which were funded under the Energy Savings Fund (Rounds One and Two).

Appendix C Projects discontinued during 2010–11

Table C1

Discontinued projects in 2010–2011

Applicant Name	Project title	Funding allocated ($)*
Aged Care Association Australia – NSW	Residential Aged Care Water and Energy Savings Program	545,000
Mingara Recreation Club Ltd	Wetlands Sustainable Stormwater Harvesting Project	93,820
Nowra Local Aboriginal Land Council	Water Saving Improvements Project	20,000
Manly Council	Effluent Recycling for Irrigation	1,600,000
The Factory Community Centre	Water and Energy Saving Project	399,295
Budgewoi Soccer Club	Budgewoi recycled water reuse project	250,000
Wyong Shire Council	Tertiary Treated Effluent Reuse Project - Halekulani Park Hall	110,000
Wyong Shire Council	Tertiary Treated Effluent Reuse Project in Budgewoi – Slade Park	125,000
Ryde Hunters Hill District Hockey Club Inc	Recycling Stormwater for use on Synthetic Hockey Field, North Ryde	25,000
Energy Response Pty Ltd	Demand Side Response Project in Constrained Areas	2,500,000
		5,668,115

* Funding approved by the Minister, not actual expenditure.

Glossary

Glossary

the Act	*Energy and Utilities Administration Act 1987*, under which the NSW Climate Change Fund is established
AEMC	The Australian Energy Market Commission
biogas	A by-product of anaerobic digestion, which is the decomposition process of micro-organisms. This gas by-product can be harvested and converted to energy.
CCF	NSW Climate Change Fund
tCO_2-e	An abbreviation of 'tonnes of carbon dioxide equivalent'; the internationally recognised measure of greenhouse gas emissions.
cogeneration	The simultaneous generation of electrical and thermal energy, where both forms of energy are put to productive use. Cogeneration is typically possible when facilities produce large amounts of waste heat (usually in the form of steam or hot water) that can be used efficiently for space or water heating, cooling, industrial use, agriculture or conversion into electricity.
DEC	The NSW Department of Education and Communities.
DPC	The NSW Department of Premier and Cabinet.
efficiency (energy and water)	Reducing the amount of energy or water required to provide a given level of service (e.g. for lighting, air conditioning or toilet flushing).
ESAP	Energy Savings Action Plan
ESF	Energy Savings Fund
feed-in tariff	A premium rate paid for electricity fed back into the electricity grid from a designated renewable electricity generation source.
flow restrictor	A device used to restrict the amount of water flow for a given use. For example, flow restrictors are often installed on taps to inhibit the amount of water people can use to wash their hands.
fluorescent lamp	A low-pressure mercury discharge lamp that emits light through a phosphor coating. Tubular and compact types are available. General office lighting mainly uses tubular fluorescent lamps.
GBP	Green Business Program
gigajoule (GJ)	A joule is a unit of energy, equivalent to a power of one watt for one second. A gigajoule is 1,000 million joules.
greywater	Wastewater from a variety of sources within households or businesses, typically sourced from baths, showers, laundries or basins. Greywater is not sourced from toilets or bidets.
groundwater	Water that has been collected in an aquifer or the water table that is below ground level.
harvesting	Collecting rain or stormwater for reuse.
heat pump	A device that pumps heat energy used in both heating and cooling systems. As heating units, heat pumps are able to extract heat energy from extremely cold outdoor air to heat the inside of a structure. When used as cooling units they can extract heat from indoor air, even if the outdoor air is much hotter.
HVAC	Heating, ventilation and air-conditioning
IPART	The Independent Pricing and Regulatory Tribunal; the independent economic regulator for NSW.
kilolitre (kL)	A volumetric measurement equivalent to 1,000 litres, or one cubic metre.
kilowatt hour (kWh)	A quantitative measure of electric current flow equivalent to one thousand watts being used continuously for a period of one hour; the unit most commonly used to measure electrical energy. A kilowatt is 1,000 watts (see definition under watt).
kilovolt ampre	A unit of electrical power equal to 1000 volt-ampres
megalitres (ML)	A volumetric measurement equivalent to one million litres.
megawatt hour (MWh)	A unit of electricity equivalent to 1,000 kilowatt hours or one million watts.
National Australian Built Environment Rating System (NABERS)	NABERS is a performance-based rating system for existing buildings. NABERS rates a building based on its measured operational impacts on the environment and provides a simple indication of how well inhabitants are managing these environmental impacts compared with peers and neighbours.
OEH	The Office of Environment and Heritage (a division of the NSW Department of Premier and Cabinet).
payback period	The time taken for savings or profit from an investment to pay for the initial capital expenditure. Payback period = Capital cost/total annual savings. For example, a new lighting system costing $400 with $200 savings per year has a payback period of $400/$200 = two years.
peak demand	The maximum power demand of a system at a given time, or the maximum power required to supply customers at any time. This may be at a particular time of the day or a specific hour of the day.
PFP	Public Facilities Program
photovoltaic (PV)	A form of solar energy that directly converts light into energy.
potable water	Water that is suitable for drinking.

power factor correction (PFC)	The demand for electricity a site places on the electricity network is expressed in kVA (1,000s of volt amps) and is a measure of the customer's load on the power supply network. The power factor is the ratio of the actual power in kW divided by the kVA. The ratio is between 0 and 1, where 1 means that a site is making the most effective use of its electricity supply. Power factor correction reduces peak demand on the electricity supply network by bringing the ratio closer to 1.
recycled water	Water taken from a non-potable source and treated to a level suitable for its intended use.
renewable energy	Energy which is generated from renewable sources, including the sun, wind, waves, water (hydroelectricity) and waste, as opposed to fossil fuels that emit greenhouse gases.
retrofit	Upgrading an existing system or building, typically to make it more energy or water efficient.
sewer mining	Sewer mining involves tapping directly into a sewer main either before or after a treatment plant and extracting the wastewater. The wastewater can be treated and reused as recycled water.
solar energy	Solar power refers to the potential of the sun to produce energy. Solar energy can be generated using a wide variety of methods, ranging from simple water recirculating systems used to heat homes and commercial offices, to sophisticated networks of solar cells that produce enough energy to supply small cities.
stormwater harvesting	The collection and reuse of rainwater that would otherwise end up in the stormwater channels that lead to a river or the ocean. Harvesting stormwater generally involves two stages: storage and treatment. Stormwater usually comes in large volumes during a rainfall event, and as such, must be stored to allow for reuse. Because stormwater is typically low quality with a high level of pollutants, it must be sufficiently treated. The most common reuse of stormwater is for irrigation.
variable speed drives	These are mechanisms that control motor speed. They can be installed on motors driving fans and pumps to adjust to speed at which they run. This means that the amount of energy being consumed can be adjusted to match the demand, reducing energy waste.
wastewater (and wastewater recycling)	Wastewater is water that has been contaminated by some activity, and includes greywater and sewage. It can be collected from a variety of sources, then stored and treated so it can be used as an alternative to the potable water supply.
watt (W)	The unit for measuring electrical power. The rate of energy consumption by an electrical device when it is in use is measured in watts.
WSAP	Water Savings Action Plan
WSF	Water Savings Fund

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